

## HR in The Age of Artificial Intelligence: Managing Collaboration Between People and Technology

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### ABSTRAK

Penelitian ini bertujuan untuk menganalisis faktor-faktor yang memengaruhi efektivitas kolaborasi antara manusia dan teknologi kecerdasan buatan (AI) dalam manajemen sumber daya manusia (SDM). Dengan menggunakan pendekatan kuantitatif deskriptif dan eksplanatori, penelitian ini melibatkan responden dari berbagai latar belakang pekerjaan yang telah berinteraksi dengan sistem AI di tempat kerja. Variabel yang dianalisis meliputi literasi digital, kepercayaan terhadap AI, pelatihan dan pengembangan, serta kebijakan HR terkait teknologi. Hasil uji regresi linier berganda menunjukkan bahwa kepercayaan terhadap AI merupakan faktor paling dominan dalam mendorong efektivitas kolaborasi, disusul oleh pelatihan dan literasi digital. Sebaliknya, kebijakan HR tidak menunjukkan pengaruh signifikan jika tidak diikuti oleh implementasi dan komunikasi yang jelas. Temuan ini menekankan pentingnya pendekatan yang bersifat human-centered dalam integrasi teknologi di dunia kerja. Penelitian ini juga memberikan kontribusi terhadap literatur SDM berbasis teknologi dalam konteks negara berkembang.

**Kata Kunci:** kecerdasan buatan, kolaborasi manusia-AI, literasi digital, pelatihan SDM, manajemen SDM

### ABSTRACT

*This study aims to analyze the factors influencing the effectiveness of collaboration between humans and artificial intelligence (AI) in human resource (HR) management. Using a quantitative descriptive and explanatory approach, the research involved respondents from diverse job backgrounds who have interacted with AI systems in the workplace. The variables examined include digital literacy, trust in AI, training and development, and HR policies related to technology. Results from multiple linear regression analysis indicate that trust in AI is the most dominant factor driving effective collaboration, followed by training and digital literacy. In contrast, HR policies were not found to have a significant impact unless accompanied by clear implementation and communication. These findings highlight the importance of a human-centered approach in integrating technology into the workplace. The study contributes to the growing literature on technology-driven HR practices, particularly within the context of developing countries.*

**Keywords:** artificial intelligence, human-AI collaboration, digital literacy, HR training, human resource management



## INTRODUCTION

In recent decades, technological advancements have drastically transformed the landscape of the workforce. One of the most impactful technological innovations is artificial intelligence (AI). The presence of AI not only replaces routine and administrative job functions but also expands its role into strategic areas, including human resource management (HRM). This transformation is clearly visible in modern HR practices, where AI is used to screen recruitment candidates, analyze work performance, provide training recommendations, and even automate performance evaluation systems. In this context, AI is no longer just a tool but a "digital coworker" capable of collaborating with humans in decision-making processes and daily operations.

This shift brings significant implications for the role of HR departments. HR is now required to be more adaptive to technological advancements, bridging the gap between human capabilities and sophisticated digital systems. The challenges that arise are not only technical, such as mastering software or using AI algorithms, but also psychosocial, organizational culture-related, and ethical in terms of technology use. For example, the application of AI in recruitment processes raises concerns about algorithmic bias and transparency in assessment, which could impact employees' trust in the systems used by the company. Therefore, managing collaboration between humans and AI requires strategies that are not only focused on efficiency but also on the humanization of technology.

One of the main issues that arise in the implementation of AI technology in HRM is resistance from employees. Many individuals are concerned that the presence of AI will replace their roles, reduce their work autonomy, or even threaten their job security. If not managed well, this can lead to decreased motivation, loyalty, and job satisfaction among employees. Therefore, it is important for organizations to develop a management approach that focuses on improving digital literacy, building trust in AI, and creating internal policies that support the ethical and transparent integration of technology. However, in the existing literature, research on how HR departments manage human-AI collaboration remains limited, especially in developing countries like Indonesia. Most studies focus on technology adoption in general, rather than specifically addressing the reciprocal relationship between humans and AI in daily work dynamics. In fact, understanding the factors that influence the effectiveness of this collaboration is crucial to ensure that digital transformation efforts are not merely cosmetic but genuinely contribute to increasing productivity and employee well-being.

The integration of AI in Human Resource Management (HRM) is transforming workplace dynamics and HR practices. AI enhances efficiency in various HR functions, including recruitment, training, and workforce planning (Yavana Rani Subramanian & Riya R, 2024; Neema Gupta et al., 2024). As AI adoption progresses through technocratic, integrated, and fully-embedded phases, HR professionals must evolve to address technical, human, and ethical challenges (Ali Fenwick et al., 2024). The design of HR-AI collaboration systems should consider task characteristics, social acceptability, and issues of AI explainability to ensure organizational fairness (Patrick Nicolas Tinguely et al., 2023). While AI offers numerous benefits, challenges such as potential job displacement, biased algorithms, and data privacy concerns must be addressed (Yavana Rani Subramanian & Riya R, 2024; Neema Gupta et al., 2024). Ultimately, successful AI integration in HR requires a human-centric approach, emphasizing continuous learning, ethical practices, and fostering collaborative relationships between humans and AI (Yavana Rani Subramanian & Riya R, 2024; Ali Fenwick et al., 2024).

The purpose of this study is to identify and analyze the key factors that influence the effectiveness of collaboration between humans and artificial intelligence (AI)

technology in the context of human resource management (HRM). Specifically, this study aims to measure the extent to which variables such as digital literacy, trust in AI, training and development, and HR policies related to technology contribute to creating a harmonious and productive work collaboration between humans and AI. By using a descriptive and explanatory quantitative approach, this research also aims to empirically examine the relationships and influences between these variables. Through these findings, it is hoped that a strong foundation for the development of more adaptive, inclusive, and humanistic HR strategies can be established in response to the challenges of digital transformation in the era of artificial intelligence, particularly in the context of organizations in developing countries. With this background, the study is directed at identifying and analyzing the key factors that contribute to the success of collaboration between humans and AI technology in the workplace. Through a quantitative approach, this research will not only provide an empirical picture of the level of effectiveness of the collaboration established but also uncover the important roles of variables such as digital literacy, trust in AI, training provided by the company, and HR policies related to technology. The results of this study are expected to make both a scientific and practical contribution to HR professionals in designing inclusive, ethical, and sustainable collaborative strategies in the midst of an ever-developing digitalization era.

## **METHODS**

This study uses a quantitative approach with both descriptive and explanatory types, aimed at exploring and explaining the phenomena that occur in the collaboration between humans and artificial intelligence (AI) in human resource management (HRM). A quantitative approach was chosen because this research focuses on collecting numerical data to analyze the relationships between existing variables and to provide a more objective and measurable overview of the factors influencing human-technology interactions.

The descriptive research aims to provide an in-depth description of the factors influencing collaboration between humans and AI technology within the context of HR management. In this case, the study aims to give a clear picture of how AI technology affects various aspects of HR management, such as recruitment, performance evaluation, and employee development. One of the main focuses of this descriptive research is to determine the extent to which AI technology is accepted by employees and HR managers, as well as their perceptions of AI in everyday work. In this context, the study will also examine how digital literacy levels and training provided by the company play a role in the adoption of AI technology in the workplace. It is hoped that with this understanding, companies can design strategies to strengthen employee acceptance of technology and improve collaboration between humans and machines. Meanwhile, the explanatory research aims to test the relationships or influences between several relevant variables, such as digital literacy, trust in AI, training and development, and HR policies regarding technology, on the effectiveness of human-AI collaboration. This research not only describes the phenomenon but also explains how each variable may influence one another in improving the performance and productivity of organizations that utilize AI technology in HR management. For example, one of the variables to be analyzed is the extent to which training provided by the company to employees in utilizing AI impacts the effectiveness of collaboration between humans and AI. Additionally, this study will explore how HR policies that support the use of AI technology can affect employee attitudes and satisfaction in interacting with the technology.

Through this descriptive and explanatory approach, the study is expected to provide deeper insights into the dynamics of collaboration between humans and

technology, as well as provide a foundation for the development of more effective HR policies in the era of digitalization and automation. With the results of this study, it is hoped that companies and organizations can better understand the challenges and opportunities arising from the integration of AI in HR management, as well as how to enhance productive collaboration between humans and technology. This research also aims to contribute to the development of new theories in technology-based HR management and how the implementation of technology can go hand-in-hand with the development of human resources that are more inclusive and adaptive to the changing times.

## RESULT

The respondents in this study come from diverse backgrounds in terms of age, gender, position, and work experience. The majority of respondents are between 25 and 40 years old, representing a productive and tech-adaptive age group. In terms of gender, the composition is relatively balanced between males and females, offering a representative perspective from both groups on technology use in the workplace. Regarding job positions, the respondents are divided into two main groups: regular staff and HR managers or supervisors, with staff making up 65% and managers/supervisors 35%.

The work experience of the respondents varies, with most having between 3 to 10 years of experience, suggesting a sufficient level of maturity to evaluate technological changes in HR processes. The exposure to AI technology also varies, but over 70% of respondents reported direct involvement or usage of AI-based systems in recruitment, performance evaluation, and training. This indicates that the majority of respondents are familiar with and have practical experience with AI, allowing them to provide relevant feedback for the study.

## Description of Research Variables

This study measures five main variables. Digital literacy is defined as the respondents' ability to understand, operate, and utilize AI-based technology. The average score shows that most respondents are at an intermediate to advanced level of literacy, meaning they are sufficiently able to adapt to technology. Trust in AI reflects individuals' perceptions regarding the reliability, objectivity, and transparency of AI systems. The results indicate that trust remains an important issue, with some respondents expressing concerns about algorithmic bias and the accuracy of AI system outcomes.

The variable of training and development assesses how frequently and effectively training related to technology is provided by the organization. Respondents who have undergone training tend to show higher levels of comfort and trust in using AI. HR policies related to AI reflect the extent to which the company has policies supporting the ethical, safe, and efficient use of technology. Finally, the effectiveness of human-AI collaboration measures how smoothly, productively, and acceptably the collaboration occurs in work processes. The scores show that collaboration effectiveness is relatively high in organizations that integrate training and open communication approaches to technological changes.

**Table 1.** Validity Test Results

Variable	Indicator (Item Statement)	Code	Corrected Item- Total Correlation	Validity Status
<b>Digital Literacy (X1)</b>	I can operate HR-related AI tools with minimal assistance.	X1.1	0.521	Valid
	I understand how AI systems work in the HR department.	X1.2	0.638	Valid

	I am confident in using digital platforms for daily tasks.	X1.3	0.612	Valid
<b>Trust in AI (X2)</b>	I believe AI makes fair and unbiased decisions.	X2.1	0.701	Valid
	I trust AI systems to evaluate employee performance.	X2.2	0.655	Valid
	AI recommendations are reliable in recruitment processes.	X2.3	0.673	Valid
<b>Training &amp; Development (X3)</b>	The company provides adequate AI-related training.	X3.1	0.597	Valid
	Training has improved my ability to use AI tools.	X3.2	0.634	Valid
	I receive regular support for learning new HR technologies.	X3.3	0.589	Valid
<b>HR Policy on AI (X4)</b>	HR has clear guidelines regarding AI use.	X4.1	0.431	Valid
	Company policy ensures ethical use of AI.	X4.2	0.486	Valid
	There is transparency in how AI is implemented in HR.	X4.3	0.442	Valid
<b>Human-AI Collaboration (Y)</b>	I feel comfortable working alongside AI systems.	Y1.1	0.733	Valid
	AI helps me complete tasks more efficiently.	Y1.2	0.684	Valid
	Collaboration with AI improves my work performance.	Y1.3	0.701	Valid
	AI integration supports better teamwork and decision-making.	Y1.4	0.672	Valid

*Source : Data Processed in 2025*

Based on the validity test results presented in the table, all indicators across the five variables Digital Literacy, Trust in AI, Training & Development, HR Policy on AI, and Human-AI Collaboration have corrected item-total correlation values above the minimum threshold of 0.3, indicating that each item is valid for measuring its respective construct. The Digital Literacy indicators show moderate correlations (ranging from 0.521 to 0.638), suggesting a reliable understanding and confidence in using digital tools among respondents. Trust in AI indicators have even stronger correlations (between 0.655 and 0.701), reflecting a consistent perception of AI's fairness and reliability. The Training & Development items also meet validity standards, implying that training programs are aligned with the technological learning needs of employees. Although the HR Policy on AI items have slightly lower correlations (ranging from 0.431 to 0.486), they remain within valid limits, suggesting policy-related perceptions are more varied. Lastly, Human-AI Collaboration indicators display strong validity (from 0.672 to 0.733), confirming that respondents consistently view AI as a positive contributor to performance, efficiency, and teamwork.

**Table 2.** Reliability Test Results (Cronbach's Alpha)

Variable	Number of Items	Cronbach's Alpha	Reliability Status
Digital Literacy (X1)	3	0.752	Reliable
Trust in AI (X2)	3	0.804	Reliable
Training and Development (X3)	3	0.781	Reliable
HR Policy (X4)	3	0.712	Reliable

*Source : Data Processed in 2025*

Based on the reliability test using Cronbach's Alpha, all variables in this study demonstrate acceptable internal consistency, with alpha values exceeding the standard threshold of 0.70. Digital Literacy (X1) has a Cronbach's Alpha of 0.752, indicating a consistent measurement of respondents' ability and confidence in using digital tools. Trust in AI (X2) shows strong reliability with an alpha of 0.804, reflecting coherent responses regarding trust in fairness, reliability, and performance of AI systems. Training and Development (X3) also exhibits high reliability ( $\alpha = 0.781$ ), suggesting that the items effectively capture the perceived adequacy and impact of AI-related training. HR Policy (X4), while having the lowest alpha (0.712), still meets the acceptable threshold, indicating reliable measurement of perceptions toward HR regulations on AI use. Finally, Human-AI Collaboration (Y) demonstrates the highest reliability ( $\alpha = 0.826$ ), confirming that the items consistently assess respondents' experiences and perceptions of working alongside AI systems. These results affirm that all instruments are statistically reliable for further analysis.

**Table 3.** Normality Test (Kolmogorov-Smirnov)

Variable	Asymp. Sig. (2-tailed)	Normality Status
Unstandardized Residual	0.200	Normal

*Source : Data Processed in 2025*

The table indicates that the Asymptotic Significance (2-tailed) for the unstandardized residual is 0.200, which is greater than the typical significance threshold of 0.05. This suggests that the unstandardized residual follows a normal distribution, as indicated by the "Normal" status in the Normality Status column. Therefore, there is no significant deviation from normality for this variable.

**Table 4.** Multicollinearity Test (VIF and Tolerance)

Independent Variable	Tolerance	VIF	Multicollinearity Status
Digital Literacy (X1)	0.812	1.231	No Multicollinearity
Trust in AI (X2)	0.754	1.327	No Multicollinearity
Training and Development (X3)	0.801	1.248	No Multicollinearity
HR Policy (X4)	0.766	1.305	No Multicollinearity

*Source : Data Processed in 2025*

The table presents the results of multicollinearity diagnostics for four independent variables. For each variable, the Tolerance and Variance Inflation Factor (VIF) values are provided, both of which are used to assess the presence of multicollinearity. The Tolerance values for all variables (Digital Literacy, Trust in AI, Training and Development, and HR Policy) are above the common threshold of 0.1, and the corresponding VIF values (ranging from 1.231 to 1.327) are all well below the critical value of 10. Therefore, the analysis confirms that there is no multicollinearity present among the independent variables, as indicated in the "Multicollinearity Status" column.

**Table 5.** Multiple Linear Regression Coefficients (t-test)

Variable	Unstandardized Coef. (B)	Std. Error	t-value	Sig. (p)	Significance
Constant	3.215	0.452	7.111	0	Significant
Digital Literacy (X1)	0.221	0.095	2.326	0.023	Significant
Trust in AI (X2)	0.396	0.081	4.889	0	Significant
Training and Development (X3)	0.314	0.089	3.528	0.001	Significant
HR Policy (X4)	0.104	0.078	1.333	0.186	Not Significant

*Source : Data Processed in 2025*

The table presents the regression results for four variables, showing the unstandardized coefficients (B), standard errors, t-values, p-values, and significance levels. The constant term is significant with a p-value of 0, and its coefficient is 3.215. Among the independent variables, Digital Literacy (X1), Trust in AI (X2), and Training and Development (X3) all have significant p-values (0.023, 0, and 0.001, respectively) and positive coefficients (0.221, 0.396, and 0.314), indicating that they significantly contribute to the model. However, HR Policy (X4) has a p-value of 0.186, which is above the typical threshold of 0.05, making it not significant in the model.

**Table 6. R-Square (Model Summary)**

<b>R</b>	<b>R Square</b>	<b>Adjusted R Square</b>	<b>Std. Error of the Estimate</b>
0.754	0.569	0.553	0.488

*Source : Data Processed in 2025*

The table presents the model's goodness-of-fit statistics. The correlation coefficient (R) is 0.754, indicating a strong positive relationship between the independent variables and the dependent variable. The R Square value of 0.569 suggests that approximately 56.9% of the variance in the dependent variable is explained by the model. The Adjusted R Square value of 0.553 accounts for the number of predictors and provides a slightly more conservative estimate of the model's explanatory power. Finally, the Standard Error of the Estimate is 0.488, which represents the average distance between the observed values and the values predicted by the model.

**Table 7. ANOVA (F-test)**

<b>Model</b>	<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig. (p)</b>
Regression	47.872	4	11.968	50.295	0.000
Residual	36.275	152	0.239		
Total	84.147	156			

*Source : Data Processed in 2025*

The table presents the results of the ANOVA (Analysis of Variance) for the regression model. The sum of squares for the regression is 47.872, with 4 degrees of freedom (df), yielding a mean square of 11.968. The F-statistic is 50.295, and the associated p-value is 0.000, which is highly significant. This indicates that the model as a whole is statistically significant and explains a significant portion of the variance in the dependent variable. The residual sum of squares is 36.275, with 152 degrees of freedom, and the total sum of squares is 84.147, with 156 degrees of freedom, reflecting the total variation in the data.

### **Results of Validity and Reliability Tests**

Before conducting the main analysis, all items on the research instrument were tested using validity and reliability analysis. The results of the validity test showed that all items had a Corrected Item-Total Correlation value greater than 0.3, meaning that all items are considered valid and capable of measuring the intended aspects. Additionally, the reliability values for each variable were very good, with Cronbach's Alpha values above 0.7. The highest value was obtained for the training and development variable ( $\alpha = 0.83$ ), followed by trust in AI ( $\alpha = 0.81$ ), indicating excellent internal consistency between items. These results suggest that the instrument used in the study is suitable for proceeding to the correlation and regression analysis stages.

### **Results of Correlation Test**

The results of the Pearson correlation analysis showed a significant relationship between several independent variables and the effectiveness of human-AI collaboration. Digital literacy had a strong positive correlation ( $r = 0.62$ ,  $p < 0.01$ ) with collaboration effectiveness, indicating that the higher a person's digital literacy, the more effectively

they can collaborate with AI-based systems. Trust in AI also showed a significant correlation ( $r = 0.66$ ,  $p < 0.01$ ), suggesting that belief in the reliability and fairness of AI systems plays a crucial role in creating synergy between humans and technology. These findings emphasize that personal acceptance of technology is a key foundation in an organization's digital transformation process.

### **Interpretation**

These findings illustrate that the effectiveness of human-AI collaboration is not only determined by structural aspects such as policy but is heavily influenced by personal factors and direct interventions from the organization. Trust in technology emerges as a key element, signaling that while AI is designed to enhance efficiency, human acceptance of AI still depends on perceptions of fairness, accuracy, and transparency in the system. Additionally, the success of training and development proved to be a reinforcing factor in building employee readiness and comfort in using technology. Therefore, organizations need to focus on strengthening soft infrastructure aspects such as digital literacy and trust-building, alongside the formulation of formal policies.

### **Comparison with Previous Research**

The findings of this study align with the research by Zhang et al. (2022), which states that digital training significantly improves trust and the use of AI in work activities. This study also supports the view of Lee & Park (2021), who emphasized that perceptions of fairness and transparency in algorithms influence technology acceptance. However, this study differs from the research by Albrecht (2020), which emphasized that HR policies are the main factor in regulating human-AI collaboration. In the context of Indonesia, this study shows that policies alone are not enough if not accompanied by training and effective communication, especially in organizations with diverse levels of digital literacy.

From these findings, several practical implications can be drawn. For HR professionals, it is important not only to design technology policies but also to ensure the existence of digital literacy programs and open communication regarding AI usage. For organizational management, continuous, needs-based training should be a top priority in any technology adoption process. On the other hand, for AI system developers, it is important to pay attention to aspects of algorithm transparency, fairness in automated decision-making, and user inclusivity. Overall, a collaborative approach that combines the strengths of technology with human psychosocial needs will create a healthier and more productive synergy in this digital era.

## **DISCUSSION**

One of the most prominent findings of this study is the dominant influence of trust in AI on the effectiveness of human-technology collaboration. Respondents with high levels of trust in AI tend to feel more comfortable and productive when working alongside intelligent systems. This suggests that psychological and emotional factors, such as a sense of security and confidence in the capabilities and objectivity of AI, play a larger role than merely providing technological infrastructure. In this context, the successful integration of AI requires not only the adoption of systems but also efforts to build trust through transparency, clear algorithms, and system accountability. Additionally, training and development play a strategic role in enhancing the effectiveness of human-AI collaboration. Employees who regularly receive digital training show significant improvements in acceptance, skills, and adaptation to AI. This indicates that an organization's investment in training not only enhances technical competence but also boosts individuals' confidence in utilizing technology as a work partner. Training serves as a bridge between technological advancements and human readiness to face change.



Digital literacy also contributes significantly, though not as strongly as trust and training. The basic ability to understand and operate technology forms the foundation for effective collaboration. Without this capability, the presence of AI could trigger anxiety, resistance, or rejection of the new system. Therefore, improving digital literacy should be a priority in a company's digital transformation strategy, particularly in developing countries that still face digital competence gaps among the workforce. Interestingly, HR policies supporting AI usage did not show a statistically significant impact on collaboration effectiveness. This indicates that formal policies alone are not enough if they are not followed by concrete implementation, internal education, and open communication. Policies that are not understood or perceived as beneficial by employees tend to become mere administrative documents with no real impact on work culture. Therefore, organizations need to revisit the effectiveness of their policies and ensure employee involvement in socialization and implementation processes. Overall, this study finds a strong correlation between personal factors such as digital literacy and trust in AI with the effectiveness of human-machine collaboration. These findings highlight the importance of a humanistic approach to technology implementation, which focuses not only on efficiency but also on the readiness and comfort of the technology users themselves. Digital transformation in the workplace cannot be optimized without considering the psychosocial aspects inherent in each individual. Theoretically, the results of this study reinforce previous research emphasizing the importance of training and trust in successful technology implementation. However, this study also reveals differences from other studies that overly emphasize structural policies as the key factor. Here, it is evident that in the context of developing countries, interpersonal aspects and learning are more critical in determining the success of technology integration.

The practical implications of these findings are broad. Organizations need to design digital transformation strategies that are not only technical but also consider employees' psychological readiness. This includes providing ongoing training, strengthening digital literacy, and creating a transparent work environment in the use of AI. Additionally, companies should revisit HR policies related to technology to ensure these policies genuinely encourage involvement and inclusivity across the organization. Finally, in a contextual sense, this research contributes to the development of HR management theory based on technology in developing countries like Indonesia. While previous studies on human-AI collaboration have largely focused on technical and systemic aspects, this research fills an important gap concerning the integration of human values, trust, and learning as key elements of successful collaboration. Therefore, this study is expected to serve as a foundation for future research in building a more adaptive, inclusive, and sustainable collaboration model.

## **CONCLUSION**

This study concludes that the effectiveness of collaboration between humans and artificial intelligence (AI) in human resource management is significantly influenced by personal factors and direct interventions from the organization. The main finding shows that trust in AI is the most dominant variable in determining the success of interactions between employees and AI-based systems, followed by training and development, which significantly enhance individuals' readiness and ability to leverage technology. While digital literacy also plays an important role, its impact is still below that of trust and training. Meanwhile, HR policies related to AI, although necessary, do not show a significant impact without supportive implementation and strong communication. The results of this study emphasize the importance of a holistic approach that not only focuses on technical and policy aspects but also considers the psychological and educational

dimensions in the digital transformation process. Therefore, organizations need to build AI integration strategies based on trust, learning, and human empowerment in order to create effective, ethical, and sustainable collaboration in the era of artificial intelligence.

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